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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/030,555	01/04/2002	Panu Hagstrom	2709/0K126	8769

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EXAMINER
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NGUYEN, KHAI MINH

ART UNIT	PAPER NUMBER
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2684

DATE MAILED: 05/21/2004

5

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/030,555

Applicant(s)

HAGSTROM, PANU

Examiner

Khai M Nguyen

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— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                                    | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Specification***

1. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

#### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or  
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (e) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (f) BRIEF SUMMARY OF THE INVENTION.
- (g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (h) DETAILED DESCRIPTION OF THE INVENTION.
- (i) CLAIM OR CLAIMS (commencing on a separate sheet).
- (j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins (US-5355526) in view of O'Neill (US-5969681).

Regarding claims 1 and 6, Higgins teaches a communications apparatus and a structure of a radio frequency front end comprising as functional units an antenna and at least one bandpass filter and at least one amplifier (col.1, lines 66-68 and col.2, lines 61-64), in which front end active and passive component parts have been integrated the structure further comprising:

- an antenna circuit board (substrates 304, Col. Lines 12-54) on a first surface of which there is at least one radiating element and on a second surface of which there is a conductive plane (308 conductive runners),
- a second circuit board (substrates 306, Col. Lines 12-54) by which said at least one filter (308 and 302 form filter 206, col.5, lines 12-54) and at least one amplifier are supported ( see fig.2, 210, 212), and one surface of which is conductive,( 308 conductive runners),
- a protective frame (fig 3. ground plane 302 ) such that the antenna circuit board, the second circuit board and the protective frame form a substantially closed space (the mobile phone inherently has a protective frame, e.g. the case or housing),

Wherein

- the antenna circuit board, the second circuit board with attached units and the protective frame form a single solid component, and the protective frame form a single solid component (integrated radio section 202, col.5, lines 20-23).

Higgins fails to specifically disclose the distance between the second circuit board and the antenna circuit board in said component is substantially smaller than a quarter of a wavelength corresponding to any operation frequency of said front end. However, O' Neill teaches the distance between the second circuit board and the antenna circuit board in said component is substantially smaller than a quarter of a wavelength corresponding to any operation frequency of said front end. (fig.2 (a) - (b), fig.6 and col.5, line 62 to col.6, line 7,col.10, line 4 to col.11, line 9). Therefore it would have been obvious to one of ordinary skill the art at the time the invention was made to use the distance between the second circuit board and the antenna circuit board in said component substantially smaller than a quarter of a wavelength corresponding to any operation frequency of said front end as taught by O'Neill with Higgins teaching in order to provide mobile phone that is small and meets consumer expectations relating to ease of portability.

Regarding claim 2, Higgins in views of O'Neill disclose a structure as recited in the rejection of claim 1. Higgins further discloses a structure comprising both a transmit and a receive branch, said functional units being a duplex filter, a low-noise amplifier and a receive filter, a transmit filter and a power amplifier, and a directional coupler (fig.2 front end 200,col.2, line 34 to col.3, line 17).

Regarding claim 3, Higgins in views of O'Neill disclose a structure as recited in the rejection of claim 1. Higgins further disclose a structure comprising both a transmit and a receive branch, said functional units being an antenna filter and antenna switch, a low-noise amplifier and a receive filter, a transmit filter and a power amplifier, and a directional coupler (fig.2 front end 200,col.2, line 34 to col.3, line 17).

Regarding claim 4, Higgins in views of O'Neill disclose a structure of claim 2, said functional units further being at least a transmit branch mixer, a receive branch mixer, a modulator, a demodulator and filters associated with these (fig.2, col.2, lines 50-54; col.4, lines 16-29).

3. Claim 5 rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins (US-5355526) in views of O'Neill (US-5969681) as applied to claim1 above, and further in view of Ayers (US-4143369).

Regarding claim 5, Higgins in views of O'Neill fail to specifically disclose an antenna being a multi-frequency antenna having at least two radiating elements on the antenna circuit board. However, Ayers teaches the antenna being a multi-frequency antenna having at least two radiating elements on the antenna circuit board (fig.1, 26 and 24, col.3, line 19-36).Therefore it would have been obvious to one of ordinary skill the art at the time the invention was made to use antenna being a multi-frequency

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antenna having at least two radiating elements on the antenna circuit board as taught by Ayers with Higgins in views of O'Neill teachings in order to provide antenna diversity capability.(col.1, lines 9-11)

***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a) Wong (US-6341217) discloses Portable telephone with shielded transmission antenna.
- b) Nakada et al (US- 6243592) disclose Portable radio.
- c) Taira et al (US-5659886) disclose Digital mobile transceiver with phase adjusting strip lines connecting to a common antenna.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khai M Nguyen whose telephone number is 703.305.9006. The examiner can normally be reached on 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay Maung can be reached on 703.308.7745. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Khai Nguyen  
Au:2684  
Date: 5/12/2004

  
**NAY MAUNG**  
**SUPERVISORY PATENT EXAMINER**